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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF ALLISTON

COUNTY OF SIMCOE

1966

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TOWN OF ALLISTON (COUNTY OF SIMCOE)

1966

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Report on a water pollution  
survey of the town of Alliston,  
county of Simcoe.

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REPORT

on a

WATER POLLUTION SURVEY

of the

TOWN OF ALLISTON

County of Simcoe

February 1966

DIVISION OF SANITARY ENGINEERING

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# THE ONTARIO WATER RESOURCES COMMISSION

## REPORT

### INTRODUCTION

The purpose of this survey was to assess the quality of the Boyne River and its tributary, Spring Creek, in the vicinity of the Town of Alliston, and to review progress relative to pollution abatement and control in the municipality.

Alliston, a town with a 1964 assessed population of 3,079 (1965 Municipal Directory) is situated in the southerly part of the County of Simcoe, on Highway No. 89 approximately 12 miles west of Highway No. 400.

Water pollution studies of this type are performed routinely, and upon request, as a basis for evaluating any existing or potential sources of pollution. Recommendations are made concerning pollution prevention and abatement.

When water and/or sewage treatment works appear desirable or extensions to present facilities are necessary, the Ontario Water Resources Commission has a programme to aid in the construction and financing of these works. The Commission also sponsors courses for plant operators to assist them in the operation and maintenance of sewage and water works.

Investigations with respect to sources of pollution in Alliston were made previously by the Division of Sanitary Engineering of the OWRC in December 1961 and again in May 1962.

## WATER SUPPLY

Municipal water is obtained from 3 deep wells designated as No. 1, 2 and 3. No treatment of the water is provided. A steel stand-pipe with a capacity of 174,000 gallons supplements the water supply.

The bacteriological quality of the water has been satisfactory.

## DRAINAGE

Surface drainage discharges to the Boyne River and Spring Creek. The Boyne River flows in an easterly direction through the north section of Alliston enroute to the Nottawasaga River. Spring Creek, a local watercourse, rises south-west of Alliston and flows north easterly to its junction with the Boyne River approximately one mile east of the town.

## REFUSE DISPOSAL

Garbage and refuse collected in the town is disposed of by periodic earth cover and compacting at a disposal area near the westerly limits of Elizabeth Street. Inspections of this site in connection with the survey, and those carried out routinely by the Commission, have indicated that this site is reasonably well maintained. The dump is sufficiently isolated from the Boyne River to disallow pollution providing the present method of operation is continued.

## SEWER SYSTEM

The town, with the exception of the north Church Street

and south King Street areas and a limited number of lots on the north side of Beach Street east of Church Street is served with a combined sewer system. Septic tank systems serve the exceptions. The combined sewer system is provided with two storm relief overflows to the Boyne River, one west of the foot-bridge, and one north of Ontario Street.

The sanitary sewage is conveyed to an activated sludge type water pollution control plant located along the bank of the Boyne River at the north end of Dufferin Street. The wastes from Salada Foods Limited are treated by means of clarifiers and waste stabilization ponds. The latter discharge into Spring Creek.

#### SEWAGE TREATMENT FACILITIES

As previously stated, the sewage treatment facilities serving Alliston include a diffused air modified activated sludge water pollution control plant and a lagoon system. Both sewage works are briefly described as follows:

##### (1) Municipal Activated Sludge Plant

Design Flow - 200,000 gpd.

Treatment - screening, grit removal, aeration,  
final settling, sludge reaeration.

Receiving Stream - Boyne River.

A summary of the average results of the samples submitted to the OWRC laboratory from August 1964 to June 1965 are shown below:

<u>Raw Sewage</u>		<u>Final Effluent</u>	
5-Day BOD (ppm)	Suspended Solids (ppm)	5-Day BOD (ppm)	Suspended Solids (ppm)
189 (28)	174 (28)	104 (30)	69 (29)



NOTE: The figure in brackets denotes the number of samples, submitted by the plant operator and Commission staff, that averages were obtained from.

Although some minor improvements have occurred in connection with the operation of this plant, the facilities do not provide adequate treatment as indicated by the above results. The average BOD and suspended solids content of 104 and 69 (ppm) respectively are considerably in excess of the recommended objective of not greater than 15 ppm each in WPCP effluents.

The operation of this plant has been hampered for some time by periodic organic and hydraulic overloading. There are also physical limitations such as the lack of a primary settling tank, inadequate sludge handling facilities and no disinfection equipment. By-passing of excessive flows apparently is a common practice particularly during periods of heavy rainfalls.

## (2) Salada Foods Limited Waste Treatment System

The waste treatment facilities for the above plant consist of primary clarifiers for the major removal of suspended solids, followed by a system of three lagoons in series. One lagoon is mechanically aerated by aerohydraulic bubble guns and there are two natural aerobic lagoons. The lagoons are owned and operated by the municipality. At present the only waste treated at these waste stabilization ponds is from the Salada Foods Plant.

A synopsis of the design data on which these facilities were constructed is shown on the following page.

Aerated lagoon	- area	- 5.42 acres
	- liquid depth	- 8 ft. (approx.)
	- volume	- 1,618,400 cu.ft. or 10,000,000 gallons
Aerobic lagoons (2)	- area	- 5 acres each
	- liquid depth	- 5 ft. each
	- total volume	- 2,178,000 cu.ft. or 13,600,000 gallons
Maximum hydraulic loading		- 540,000 Imperial Gallons/ 24 hours
Approximate retention time -		
	aerated lagoon	- 19 days
	aerobic lagoons	- <u>25 days</u>
	total time	- <u>44 days</u>
	receiving stream	- Spring Creek

Field investigations by the Industrial Waste Branch and the Purification Processes Branch of OWRC have been outlined in a report dated September, 1964. The report includes the percentage of organic loading (BOD) and suspended solids removal at various stages in the process and comments on the theoretical and actual treatment efficiencies. The conclusion is that the plant meets the anticipated BOD and suspended solids reduction percentages. A review of the analyses of samples taken of the final effluent is listed below: Mean results of a sampling programme undertaken by the Industrial Waste Branch from August 26, 1964 to September 25, 1964.

BOD of final effluent from 3rd lagoon - 40 ppm  
Suspended solids in final effluent - 60 ppm

The results of grab samples of the pond effluents are shown on the following page.

<u>Date</u>	<u>BOD</u>	<u>Suspended Solids</u>
October 6, 1964	67 ppm	80 ppm
November 16, 1964	120 ppm	64 ppm
December 14, 1964	155 ppm	308 ppm
January 19, 1965	300 ppm	364 ppm
February 23, 1965	460 ppm	254 ppm
March 30, 1965	490 ppm	192 ppm
May 3, 1965	310 ppm	136 ppm
May 19, 1965	180 ppm	72 ppm
June 7, 1965	135 ppm	172 ppm
June 14, 1965	118 ppm	209 ppm
September 15, 1965	21 ppm	40 ppm

The BOD and suspended solids content of the final effluent are considerably higher than the Commission objectives of not greater than 15 ppm.

Although previous studies have shown that this lagoon system satisfies anticipated BOD and suspended solids reductions the organic overloading results in an unsatisfactory effluent. It is noted that Dr.C.P. Fischer of the University of Waterloo has been contracted by Aero Hydraulics Corporation to evaluate the performance of the entire lagoon treatment system and especially the aerated section. The Division of Industrial Wastes of the OWRC have accomplished an additional survey in the fall of 1965. The necessity of the acceptance of recommendations resulting from these evaluations is reaffirmed.

#### SOURCES OF POLLUTION

(a) This section reviews sources of pollution located at the time of the survey, and in addition previously known conditions

not mentioned otherwise in this report.

1. Private drain in front of No. 4 Fletcher Crescent. Indicated on appended street plan as N.B. - 52.5P - Type - 4-Inch diameter transite pipe. Approximate flow at time of inspection - 5 gpm.

The effluent was not gaining access to the Boyne River at the time of the investigation but evidence indicated that under heavy surface runoff the waste would reach the river. Results of samples taken and appended to this report designated as Table I, showed a suspended solids content in excess of the Commission objective and an abnormally high bacteriological count. The appearance of this effluent resembled laundry waste.

2. Storm sewer at Church Street north-east side of bridge designated on appended street plan as N.B. - 52.5W - Type - 15-Inch corrugated pipe. Approximate flow at time of inspection - 2 gpm.

The results of samples of this effluent, showed a suspended solids content in excess of the Commission objective and a bacteriological count that is high for the type of waste.

3. Storm sewer north-west side of bridge, designated on appended street plan as N.B. - 52.5W3 - Type - 8-Inch diameter corrugated pipe. Approximate flow - 3 gpm.

The results of samples taken from this effluent showed an excessively high bacteriological count.

The results of these samples indicated the necessity of redirecting illegal drainage connections to municipal sanitary sewers. It is evident that some polluting material is gaining access to the above mentioned storm sewers and the Boyne River.

#### Dam on the Boyne River

A special investigation of a dam site on the Boyne River near Boyne Street was made on June 11, 1965 by OWRC field staff. Local residents had complained to the Simcoe County Health Unit of malodorous and insanitary conditions resulting from this dam site which inhibited the flow in the Boyne River. This dam of heavy stone and clay was constructed to a height of approximately 2 feet at a point in the Boyne River approximately 900 feet downstream from the Alliston water pollution control plant.

In order to determine if the construction of this dam had contributed to deterioration of the stream a number of samples were taken on June 11, 1965. The analyses of these samples were compared with results of samples taken at the same points on May 19, 1965 prior to the construction of the dam. In both sets of samples it was noted that the Biochemical Oxygen Demand (BOD) and suspended solids concentration of the water pollution control plant final effluent greatly exceed the OWRC objectives. It was concluded that the significance of the dam and its effect on the stream could not be properly assessed due to the fluctuation of the discharge from the water pollution control plant.

(b) This section deals with sources of pollution previously outlined in pollution surveys of the Town of Alliston and improvements noted or action taken on previous recommendations.

#### Previous Reports

A water pollution survey was conducted by OWRC field staff on December 12, and December 15, 1961. Recommendations arising from this survey were as follows:

1. "The present programme for improving waste treatment facilities for the Salada-Shirriff-Horsey plant should be continued without delay until the effluent quality meets the OWRC maximum objectives of 15 ppm biochemical oxygen demand and suspended solids. This Commission should be kept informed of the progress made to decrease the pollution load discharged to Spring Creek from this source."
2. "The towns consulting engineers should be directed immediately to continue their study on sewage treatment improvements for the municipality in addition to planned waste disposal improvements for the Salada-Shirriff-Horsey plant."
3. "Refuse being dumped close to the river bank at the disposal site, should now be deposited on the top of the landfill operation and covered. Material which has accumulated near or in the river should be removed and also deposited on the top. The face of the landfill area bordering the river should then be covered with an impervious dyke to ensure that no pollution gains access to

the Boyne River.

4. "All contaminated waste flow from the Alliston Creamery should be discharged to the municipal sewerage system."

A follow up report dated May 15, 1962 reported similar conditions and reaffirmed the above recommendations.

Present Conditions With Reference to the Above Mentioned  
Recommendations

1. As outlined in another section of this report the final effluent from the Salada Foods Limited lagoons continues to greatly exceed the OWRC maximum objectives of 15 ppm for BOD and suspended solids concentration.

2. Sewage treatment improvements have not been forthcoming and the effluent from the Alliston Water Pollution Control Plant greatly exceeds the OWRC maximum objectives at 15 ppm for BOD and suspended solids concentration.

3. The refuse disposal site referred to in the previous recommendation has been abandoned. However inspections by field staff of OWRC on April 7, 1965 and May 19, 1965 have noted leachate from this disposal site running down the south bank and gaining access to the Boyne River.

4. The Alliston Creamery and Dairy have directed all waste to the municipal sewerage system.

## SUMMARY

This water pollution survey revealed significant pollution from the following sources.

- (1) The Municipal Water Pollution Control Plant.
- (2) The municipally operated Salada Foods Limited waste stabilization ponds.
- (3) Private drains and storm sewers located on the north bank of the Boyne River.

## RECOMMENDATIONS

- (1) The Town of Alliston should provide more satisfactory treatment at the municipal water pollution control plant.
- (2) Recommendations arising from present private studies and forthcoming OWRC studies should be implemented in order to provide a satisfactory effluent from Salada Foods Limited lagoons.
- (3) The private drains on Fletcher Crescent discharging what appears to be laundry waste to the north bank of the Boyne River should be disconnected and directed to the municipal sewerage system.
- (4) The town's consulting engineers should undertake a complete study of the municipal sewerage system. The preliminary proposal should allow for remedial measures to alleviate the problems outlined in this report.

All of which is respectfully submitted,

District Engineer

C.E. McIntyre, P.Eng.,

Approved by

J.R. Barr, Director,  
Div. of Sanitary Engineering.

/elb

Prepared by: D.J. Currie,  
Engineer's Assistant.



## EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

### A Bacteriological Examination

Bacteriological examinations were performed on samples from the watercourse. The Membrane Filter technique was used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm blooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as M.F. Coliform count per 100 ml.

The Commission's objective for surface waters in Ontario is a coliform count of not greater than 2,400 organisms per 100 ml.

### B Chemical Analysis

The chemical analysis performed on stream and outfall samples included determinations for biochemical oxygen demand, suspended solids, and in some instances, turbidity.

#### (1) Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters or industrial wastes. The completion of the test requires five days, under the controlled incubation temperature of 20°C.

The Commission's water quality objectives are (1) for stream water - a 5-Day BOD of not greater than 4 ppm. (11) for storm sewer, water pollution control plant and industrial waste

discharges - a 5-Day BOD of not greater than 15 ppm.

(2) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (ppm) is generally the most significant of the solids analyses in regard to stream water and outfall discharge qualities.

The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

(3) Turbidity

Turbidity is caused by the presence of suspended matter such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water or outfall discharges. It is an expression of the optical property of a sample and the results are reported in "Silica Units".

TABLE NO. I

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ml</u>
NBS-51.10	Spring Creek at County Road No.10.	May 23/63	6.5	372	10	362		15,000
		May 19/65	175	584	126	458		620,000
		Sept.15/65	61	670	42	648		250,000,000
NBS-51.90T	Salada Foods Ltd., Lagoon Outfall Sewer.	(Tabulated in separate part of report).						
NBS-52.00	Spring Creek above Lagoon Outfall.	April 3/63	2.7	462			5.0	2,300
		May 22/63	3.2	448	3	445		720
		Sept.15/65	380	924	57	867		170,000,000
NBS-52.02	Spring Creek up- stream from Lagoon Outfall.	May 19/65	180	518	72	446		370,000,000
NBS-52.39T	Effluent from Salada Foods Ltd., Clarifier.	Sept.15/65	1480	2164	662	1504		52,000,000
NBS-52.40	Spring Creek upstream from Salada Foods Ltd., Clarifier.	Sept.15/65	3.2	310	21	289		600,000

TABLE NO. I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ml</u>
NB-52.0	Boyne River at Boyne Street.	April 3/63	2.0	284			6.0	129,000
		May 22/63	3.6	314			2.6	59,000
		May 19/65	0.7	320	6	314		29,000
		June 11/65	2.0	356	34	352		12,500
		Sept.15/65	3.6	326	10	316		99,000
NB-52.15	Boyne River 250 ft. downstream from Alliston WPCP Out- fall.	May 19/65	2.6	320	14	306		45,000
		June 11/65	17	340	24	316		232,000
NB-52.20T	Outfall from Alliston WPCP.	(Tabulated in separate part of report).						
NB-52.21	Boyne River 50 ft. upstream from WPCP Outfall.	May 19/65	0.9	308	7	301		900
		June 11/65	1.1	358	3	355		2,200
NB-52.50	Boyne River at Church Street.	May 19/65	0.3	314	7	307		1,900
		Sept.15/65	1.1	222	7	315		210
NB-52.50W	Storm Sewer at N.E. Side of Church St.	May 19/65	4.2	372	28	344		23,000
NB-52.50W3	Storm Sewer N.W. Side of Church St.	May 19/65	2.4	614	5	609		450,000

TABLE NO. I (CONTD)

<u>Sampling Point No.</u>	<u>Description</u>	<u>Date</u>	<u>5-Day BOD (ppm)</u>	<u>Total (ppm)</u>	<u>Solids Susp. (ppm)</u>	<u>Diss. (ppm)</u>	<u>Turbidity in Silica Units</u>	<u>M.F. Coliform Count/100 ml</u>
NB-52.52P	4-Inch Diameter Transite Drain opp- osite Fletcher Cresc.	May 19/65	6.4	666	54	612		450,000
NB-52.53W	8-Inch Diameter Con- crete Storm Sewer.	May 19/65	8.6	928	84	844		360,000
NB-52.70	Boyne River at Foot Bridge.	May 19/65	1.3	316	11	305		380
NB-53.10	Boyne River at King Street.	May 19/65	1.0	310	10	300		380
		Sept.15/65	0.6	306	6	300		170
NB-53.80	Boyne River at Concession Rd. 7 West of Alliston.	May 22/63	2.6	294			2.6	190
		July 20/64	1.3	322	9	313		900
		Sept.16/65	0.8	294	3	291		220

